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MOISTURE CONTENT AND STORAGE AFFECT STRENGTH OF NAILED WOOD BOXES

Of two boxes made exactly alike from the same grade and thickness of lumber, one may stand ten times as much rough handling as the other, because of a difference in the moisture content of the lumber or a difference in subsequent storage conditions. Tests made at the Forest Products Laboratory, Madison, Wis., show that only when a box is to be used for an extremely short time immediately after manufacture is the proper seasoning of the lumber unimportant.

Within a week after manufacture a box made of green lumber suffers a marked reduction in strength. As the wood dries, the nails lose their grip. The fibers which are bent down along the nail shrink away from it in the direction of the end grain, the direction in which it was most firmly held, leaving the nail held only by two sides. Under such circumstances the weaving action during transportation alone will readily cause the nails to work loose and even come out of the box. Boxes made of green lumber at the Laboratory and kept for a year in dry storage tested only about one-sixth as strong as similarly-made boxes tested at the time of manufacture.

If a box is made of dry wood and then subjected to alternate wettings and dryings, through cold storage or exposure to weather, the nails will be loosened just the same as in green lumber. Boxes made up from dry lumber were kept for two weeks in damp storage and then for two weeks in dry storage. After this treatment the boxes withstood only one-tenth as much rough handling as those made of air-dry lumber which had not been subjected to adverse storage conditions.

A box made of lumber in the proper moisture condition will stand ordinary storage without any appreciable loss in the holding power of the nails. The best results are, therefore, obtained when the lumber is seasoned in accordance with the atmospheric conditions which the box will encounter in service. If it is impossible to forecast these conditions, it is advisable to use thoroughly air-dry lumber, which contains from 12 to 18 percent moisture.

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